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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

IM52/0725

WILLIAM J BURKE
SARNOFF CORPORATION PATENT OPERATIONS
CN 5300
PRINCETON NJ 08543-5300

MAYES, M
ART UNIT

PAPER NUMBER

1734
DATE MAILED:

17
07/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/183,479

Applicant(s)

Liberatore et al.

Examiner

Curtis Mayes

Art Unit

1734



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on May 21, 2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9, and 11 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 103

(1)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(2)

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (August 1974) in view of Amendola et al. 4,546,065.

IBM Technical Disclosure Bulletin (August 1974) discloses a method of making a multilayer ceramic module comprising: providing ceramic green sheets, forming recesses in the green sheets by mechanically stamping; filling the recesses with metal paste by screen-printing, laminating green sheets and firing. The IBM Bulletin does not specifically state that stamping involves using an embossing tool under heat and pressure.

Amendola et al. teach that embossing grooves and pads into a ceramic green sheet involves pressing against the surface of the greensheet, a die which carries a raised mirror image of the desired pattern to that after removal of the die, the greensheet carries the desired pattern as indentations or recesses. Embossing conditions involve heating the greensheet to a temperature at which the binder in the greensheet flows and can be shaped under pressure such as 75° to about 95°C and pressure of 500 to 3000 psi (col. 7, lines 3-33).

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It would have been obvious to one of ordinary skill in the art to have mechanically stamped the recesses in the greensheets in the method of IBM (August 1974) by using a die having a raised mirror image of the pattern and pressing against the greensheets under heat and pressure as taught by Amendola et al. as used to emboss grooves and pads into a ceramic green sheet, the embossing conditions involving heating the greensheet to a temperature at which the binder in the greensheet flows and can be shaped under pressure. Mechanically stamping the recesses in the greensheets by using a die under heat and pressure would have been obvious to one of ordinary skill in the art as taught by Amendola et al.

Screen printing the green sheets using a silver screen printing paste of silver powder and having of a viscosity of about 30 poise would have been obvious to one of ordinary skill in the art as silver is well known in the art of making multilayer ceramic modules as a metal used in metallic paste used to make a multilayer ceramic module and as about 30 poise is a suitable viscosity for a paste for screen printing conductor patterns in the indentations in the green sheets and would have been obvious to one of ordinary skill in the art.

(3)

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to Claim 1, and further in view of Vitriol et al.

Vitriol et al. teach that in a multi-layer co-fired ceramic, electrical circuit patterns on the green sheets include not only metallizations but may further include resistors, capacitors,

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inductors and other electrical components compatible with the process, the patterns formed on the sheets by screening or any other suitable method (col. 4, lines 57-63).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined for making a multi-layer ceramic module by also screen printing resistors, capacitors or inductors in the recesses in the green sheets as taught by Vitriol et al. as also screened on green sheets for making a multi-layer, co-fired ceramic laminate. Screen printing the green sheets with conductive paste to form inductors, with resistor paste, or with capacitor paste would have been obvious to one of ordinary skill in the art as Vitriol et al. teach that in a multi-layer co-fired ceramic, these electrical components may also be included by screen printing.

Screening capacitors using an ink or paste of lead magnesium niobate or barium titanate, as claimed in Claims 6 and 7, would have been obvious to one of ordinary skill in the art as these materials conventionally used for capacitors.

(4)

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to Claim 1, and further in view of Prabhu 5,277,724.

Prabhu teaches that multi-layered, co-fired ceramic on a metal base is formed by utilizing a bonding layer of low softening point glass and co-firing to bond the ceramic to the metal base. The bonding layer of glass provides a means of attaching the multi-layered ceramic to the base and minimizes shrinkage of the ceramic during the firing (col. 1, line 55 - col. 2, line 48).

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It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined for making a multilayer ceramic module by co-firing the laminated green sheets on a metal base using a low melting bonding layer of glass as taught by Prabhu for attaching a multi-layered ceramic to a base and minimize shrinkage of the ceramic during firing.

Response to Arguments

(5)

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Applicant further argues that IBM August 1974 fills some of the openings while the present claims require that embossed channels or openings be filled with a screen printed ink, thus no air gaps in the green tapes or green tape stack. Applicant argues that Vitriol et al. does not disclose embossing and that the combination is made in hindsight.

(6)

Applicant claims in Claim 1 embossing a channel or opening on the surface of a green tape and screen printing a suitable ink into the channels or openings while Claim 9 claims filling said opening by screen printing with an ink including said component material . IBM August 1974 discloses forming recesses in the green sheets by mechanically stamping and filling recesses with metal paste by screen-printing while filling other recesses with filler paste. Thus the steps of embossing and screen printing or filling as claimed are disclosed or suggested by IBM August 1974 regardless of whether other openings are filled with a filler paste to form air gaps.

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Vitriol et al. is pertinent because the references teaches that in a multi-layer co-fired ceramic, electrical circuit patterns on the green sheets include not only metallizations but may further include resistors, capacitors, inductors and other electrical components compatible with the process, the patterns formed on the sheets by screening or any other suitable method. Thus it would have been obvious to one of ordinary skill in the art to have also screen printed resistors, capacitors or inductors in the recesses in the green sheets as taught by Vitriol et al. as also screened on green sheets for making a multi-layer, co-fired ceramic laminate.

Conclusion

(7)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis Mayes, whose telephone number is (703) 308-1977. The examiner can normally be reached on Monday-Friday from 7:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino, can be reached on (703) 308-3853.

The Official FAX phone number for this Tech Center 1700 is (703) 305-7718.

The Unofficial Fax phone number is (703) 305-7115.

When filing a FAX in Tech Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and


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other communication with PTO that are not for entry into the file of the application. This will expedite processing of your papers.

The receptionist number for Tech Center 1700 is (703) 308-0661.


CURTIS MAYES
PRIMARY EXAMINER
Art Unit 1734
July 23, 2001